REMARKS

Claims 1-3, 6-10, 12, 17-19 and 21-28 are pending in this application, with claims 9, 17-19, 21 and 23-26 currently withdrawn from consideration. No amendment is made herein to the claims. It is believed that this Amendment is fully responsive to the Office Action dated **January 31, 2005**.

Claims 1-3, 6-8, 10, 12, 22, 27 and 28 are rejected under 35 U.S.C. §103(a) as being unpatentable over Hamazu et al. (US Patent No. 5,359,017); Buchwalter et al. (US Patent No. 5,879,859; Starkey (US Patent No. 5,384,339) and Green (US Patent No. 4,252,592) in view of Green (US Patent No. 4,299,938). (Office action paragraphs no. 3-14)

The rejection of claims 1-3, 6-8, 10, 12, 22, 27 and 28 is respectfully traversed, and reconsideration of the rejection is requested.

In traversing the rejection, Applicant maintains the previously presented two main arguments: 1) No *prima facie* case of obviousness can be made using the cited references; and 2) The present invention shows results that are completely unexpected over the prior art.

1) Regarding the *prima facie* case of obviousness.

Applicant maintains that no *prima facie* case of obviousness can be made using the cited references, and here addresses the Examiner's remarks in the Office action.

Regarding Hamazu, Green and Starkey. In paragraphs no. 3-8 of the Office action, the Examiner reviews the teachings of the references with regard to the proportion of curing agent (acid anhydride) to resin component in the second-to-last clause of claim 1. Paragraphs no. 4 and 5

address Hamazu et al. and Green '592, and Applicant notes that the Examiner does not point out any relevant teachings in these references.

Paragraph no. 6 of the Office action addresses the use of an anhydride thermohardening catalyst in Starkey. Starkey describes thermohardening catalysts in column 20, line 10, through column 21, line 23. The list of possible thermohardening catalysts is very long, but includes a general disclosure of acid anhydrides with listed examples in column 20, lines 34 to 49. In column 21, lines 12-23, Starkey discloses that the ratio of thermohardening catalyst to resin component, by weight is (0.01 to 10):100, or more preferably (0.05 to 5):100. The ratio is **not** discussed in molar terms.

The Examiner then considers Examples 2 and 5 of the reference, stating that 3,4-epoxycyclohexylmethyl-3,4-epoxycyclohexane carboxylate is used in these Examples, along with an aromatic sulfonium salt. The Examiner calculates the molar ratio of curing agent to photopolymerizable resin as being 0.32:1, within the claimed ratio.

However, Applicant disagrees with the Examiner's argument.

First of all, and most significantly, Example 2 in Starkey **does not appear to use an acid anhydride thermohardening catalyst.**

Secondly, in Example 2, there appear to be two resins used: cycloaliphatic resin UVR6105 and hexadecane resin UVR 6212. The wording of present claim 1 refers to the amount of "a photopolymerizable resin component", which for two resins would refer to the total number of moles of resin component. In the case of Example 2, that would be the number of moles of UVR 6105 plus

the number of moles of UVR 6212. Applicant submits that it is not clear what the Examiner is taking as the number of moles of resin in this case.

Applicant argues that the Examiner is again basing a calculation on the upper range limit of 10 parts thermohardening catalyst to 100 parts resin, with the specifically chosen examples of maleic anhydride and 3,4-epoxycyclohexylmethyl-3,4-epoxycyclohexane carboxylate, although these **do not appear** in these amounts in Examples 2 and 5 of Starkey. In fact, it appears to the Applicant that there is no acid anhydride in these Examples.

Therefore, the Examiner appears to be arguing based on **one extreme** of the possible range of molar ratios which can be inferred from Starkey's generic weight ratio, taken with **specifically picked examples of resin and thermohardening catalyst**. Applicant argues that this is a improper picking-and-choosing in order to create a limitation that does not, in fact, exist in Starkey. Applicant therefore submits that this form of argument by the Examiner does not provide a specific suggestion for the "proportion of 0.3 to 1.0 mol per mol" limitation of the present claims, and therefore, there is no *prima facie* case of obviousness for the present claims.

Regarding Buchwalter. In paragraphs no. 7-8 of the Office action, the Examiner reviews the disclosure of Buchwalter et al., analyzing Example 1 in column 9 of the reference. In Example 1, acetal diepoxide (1.8 parts), hexahydrophthalic anhydride (0.91 parts), UVI-6974 photoinitiator (0.54 parts), stannous octanoate (0.03 parts) and ethylene glycol (0.02 parts) were blended then cured at 130 °C, and later were exposed to light through a mask to create a positive image. The exact

composition of UVI-6974 is not given, but the Examiner cites column 3, line 22, which indicates that the photoinitiator in general can be a sulfonium salt. In Applicant's understanding, UVI-6974 contains "sulphonium, (thiodi-4,1-phenylene)bis[diphenyl-, bis[hexafluoroantimonate(l-)]]", and would meet the limitations of the photopolymerization initiator in claim 1. "Acetal diepoxide" appears to refer to acetaldehyde bis-(3,4-epoxycyclohexylmethyl) acetal (column 3, lines 13-15).

In Example 1 of Buchwalter, the proportion of photopolymerization initiator to the other components is 0.54:2.76, which would be **19.6 parts per 100 parts other components**. The Examiner calculates the molar ratio of the hexahydrophthalic anhydride to the resin as being 0.93:1, within the range in claim 1.

However, since **the photopolymerization initiator in Buchwalter's Example 1 is well above the range of 1.0 to 6.0 parts by weight per 100 parts other components,** required by the last clause of claim 1, Buchwalter clearly does **not** anticipate claim 1. Moreover, claim 1 clearly recites limitations on **both** the amount of curing agent and the amount of photopolymerization initiator. These limitations must be met simultaneously. Buchwalter's Example 1 **does not suggest the combination of limitations of the last two clauses of claim 1**.

Other comments. In paragraph no. 9 of the Office action, the Examiner simply summarizes that the references show photopolymerizable resins and the use of photopolymerization initiators and anhydride curing agents as in claim 1. The Examiner refers to disclosures of examples of curing agent concentration as meeting the limitation of claim 1. However, the Examiner does **not** address

the **combination** of the two limitations of the claims discussed above.

The Examiner's comments in paragraphs no. 10-11 discuss the "makes it possible to cure by chain reaction" recitation in claim 1, stating "there are no affirmative limitations ..." However, Applicant notes that this wording in the first clause of claim 1 **is not relied on as a claim limitation**. Applicant respectfully submits that the Examiner's comments in paragraphs no. 10 and 11 are therefore irrelevant to Applicant's arguments based on the limitations in the last two clauses of claim 1.

In paragraph no. 13 of the Office action the Examiner refers to the Green '938 reference as also teaching an anhydride as a curing agent (column 12, line 19). Again, what is at issue is the combination of limitations in the last two clauses of claim 1, and the Examiner's remarks do not provide any suggestion for this combination of limitations.

2) Unexpected results of the present invention.

As noted above, Applicant has argued that there is no suggestion in the cited references for the combination of limitations of claim 1. In addition, Applicant has argued, on the basis of the Declaration under 37 CFR 1.132 submitted on December 27, 2004, that there is a criticality associated with the **combination** of the limitations of the last two clauses of claim 1:

> "wherein said curing agent component is present with a proportion of 0.3 to 1.4 mol per mol of said photopolymerizable resin component which can react with said curing agent component,
>
> wherein said photopolymerization initiator component is present with a proportion of 0.1 to 6.0 parts by weight per 100 parts by weight of the whole weight

of the other components than the photopolymerization initiator component."

This criticality is clearly unexpected over the prior art, and Applicant submits that the Examiner has not given the Declaration under 37 CFR 1.132 appropriate weight.

The evidence presented in the Declaration under 37 CFR 1.132 makes it clear that this **combination** of limitations is critical–that is, there is a **synergy** such that when these two limitations are met, the reaction will proceed even after the UV light is turned off. Any independent suggestion in the prior art of amounts of the curing agent and resin components overlapping one or the other of the limitations of claim 1 does not indicate a realization of the effect observed when **both** limitations are met.

As discussed above, in paragraph no. 8 of the Office action, the Examiner states that tests II-IV of the Declaration are "not germane to the composition of Buchwalter et al. since the molar ratio is exhibited." However, Buchwalter does not meet **both** limitations of claim 1, and the Declaration is directed to the effects of the combination of limitations.

In paragraph no. 12 of the Office action, the Examiner concludes that the compositions of the prior art "inherently cure by chain reaction." As noted above, the "chain reaction" recitation occurs only in the first clause of claim 1 and does not represent a claim limitation. Nonetheless, the data presented in the Declaration under 37 CFR 1.132 clearly support the argument that the prior art does not involve curing by chain reaction, since curing by chain reaction can only be achieved under specific conditions that are not found in the prior art examples.

Applicant therefore submits that claims 1-3, 6-8, 10, 12, 22, 27 and 28 are not anticipated by and non-obvious over Hamazu et al. (US Patent No. 5,359,017), Buchwalter et al. (US Patent No. 5,879,859, Starkey (US Patent No. 5,384,339), Green (US Patent No. 4,252,592) and Green (US Patent No. 4,299,938), taken separately or in combination.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicant's undersigned agent at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicant respectfully petitions for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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